

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application. Please amend claims 33, 34, 47, 48, 61, 63, 64, and 68, as follows:

1-32. (Canceled).

33. (Currently Amended) A method for configuring radiation characteristics of an antenna, ~~the method comprising the steps of:~~
including in said antenna including a plurality of radiating elements[(:)],
~~associating wherein~~ each of said radiating elements is associated with at least a respective signal processing chain located in an antenna unit that is integral to the antenna, ~~including in said~~ at least one respective signal processing chain comprising:
at least one module for weighting digital signals, the at least one module configured to apply at least a weighting coefficient to a digital signal[(:)]; and
at least one antenna conversion set interposed between said at least one module for weighting digital signals and a respective one of the radiating elements of the antenna, said antenna conversion set being configured to convert between digital signals processed by the at least one module for weighting digital signals and analog signals transmitted and received ~~at a the~~ respective one of the radiating elements[(:)], the method comprising:
receiving, at the antenna unit, a data signal and a control signal on the same communication link, the data signal corresponding to one or more digital signals to be processed in the antenna unit and the control

signal including information indicating at least one of the weighting coefficients applied by the at least one modules for weighting digital signals;

configuring at least one weighting coefficient in the at least one modules for weighting digital signals based on the information received at the antenna unit; and

applying respective weighting coefficients to digital signals in each of the at least one module for weighting digital signals, said weighting coefficients determining the radiation characteristics of the antenna.

34. (Currently Amended) The method as claimed in claim 33, ~~comprising the step of including in said signal processing chains~~ wherein the at least one module for weighting digital signals includes first and second modules for weighting digital signals ~~as well as~~ and the at least one antenna conversion set includes first and second antenna conversion sets, said first module for weighting digital signals and first antenna conversion set operating on a signal transmitted by said radiating elements of the antenna, said second module for weighting digital signals and second antenna conversion set operating on a signal received from said radiating elements of said antenna.

35. (Previously Presented) The method as claimed in claim 34, comprising the step of applying weighting coefficients in said first and second modules for weighting

digital signals such that the antenna employs the same radiation pattern for signal transmission and reception.

36. (Previously Presented) The method as claimed in claim 34, comprising the step of applying weighing coefficients in said first and second modules for weighting digital signals such that the antenna employs different radiation patterns for signal transmission and reception.

37. (Previously Presented) The method as claimed in claim 33, comprising the step of including in said antenna conversion set at least a component that converts a signal between a radio frequency and base band.

38. (Previously Presented) The method as claimed in claim 33, comprising the step of including in said antenna conversion set at least a component that converts a signal between a radio frequency and an intermediate frequency.

39. (Previously Presented) The method as claimed in claim 34, comprising the step of associating said first and second antenna conversion sets with signal distribution elements capable of operating both on signals transmitted and received at said antenna.

40. (Previously Presented) The method as claimed in claim 39, comprising the step of choosing at least one of said signal distribution elements from a group of radio frequency duplexers and switches.

41. (Previously Presented) The method as claimed in claim 33, comprising the steps of:

generating a plurality of replications of a signal to be transmitted by said antenna;
and

sending said replications of the signal on respective signal processing chains associated with said radiating elements of the antenna.

42. (Previously Presented) The method as claimed in claim 33, further comprising:

receiving a plurality of signals at the radiating elements of the antenna;
processing each of the plurality of signals received at the radiating elements using a respective signal processing chain; and
combining the plurality of received signals processed by the signal processing chains to form a single received signal.

43. (Previously Presented) The method as claimed in claim 33, comprising the steps of:

receiving, at the antenna unit, a signal incorporating the information indicating at least one of the weighting coefficients; and

extracting, at the antenna unit, said at least one weighting coefficient from the received signal.

44. (Previously Presented) The method as claimed in claim 33, comprising the steps of:

receiving, at the antenna unit, an optical signal; and

converting the received optical signal into an electrical signal capable of being processed by said signal processing chains associated with said radiating elements of the antenna.

45. (Previously Presented) The method as claimed in claim 44, comprising the step of including in the optical signal the information indicating at least one of the weighting coefficients.

46. (Previously Presented) The method as claimed in claim 33, comprising the step of placing the antenna unit in close proximity to the antenna.

47. (Currently Amended) An antenna with configurable radiation characteristics, the antenna comprising:

a plurality of antenna radiating elements; and

an antenna unit integral to the antenna and comprising one or more signal processing chains associated with the plurality of radiating elements, the antenna unit further comprising:

at least one module for weighting digital signals, the at least one module configured to apply at least a weighting coefficient to a digital signal;

at least one antenna conversion set interposed between said at least one module for weighting digital signals and a respective one of the radiating elements of the antenna, said antenna conversion set being configured to convert between digital signals processed by the at least one module for weighting digital signals and analog signals transmitted and received at a the respective one of the radiating elements; and

an interface configured to receive a data signal and a control signal on the same communication link, the data signal corresponding to one or more digital signals to be processed in the antenna unit and the control signal including information indicating at least one of the weighting coefficients applied by the at least one modules for weighting digital signals, wherein the weighting coefficients applied by the at least one modules for weighting digital signals determine the radiation characteristics of the antenna.

48. (Currently Amended) The antenna as claimed in claim 47, wherein said one or more signal processing chains comprises first and second modules for weighting digital signals as well as first and second antenna conversion sets, said first module for weighting digital signals and first antenna conversion set operating on a signal transmitted by said radiating elements of the antenna, said second module for weighting digital signals and second antenna conversion set operating on a signal received from said radiating elements of said antenna.

49. (Previously Presented) The antenna as claimed in claim 48, wherein the antenna unit further comprises:

at least one weighting control block configured to apply weighting coefficients in said first and second modules for weighting digital signals, such that the antenna employs the same radiation pattern for signal transmission and reception.

50. (Previously Presented) The antenna as claimed in claim 48, wherein the antenna unit further comprises:

at least one weighting control block configured to apply weighting coefficients in said first and second modules for weighting digital signals, such that the antenna employs different radiation patterns for signal transmission and reception.

51. (Previously Presented) The antenna as claimed in claim 47, wherein said antenna conversion set comprises at least one frequency converter that converts a signal between a radio frequency and base band.

52. (Previously Presented) The antenna as claimed in claim 47, wherein said antenna conversion set comprises at least one frequency converter that converts a signal between a radio frequency and an intermediate frequency.

53. (Previously Presented) The antenna as claimed in claim 48, wherein said first and second antenna conversion sets are associated with signal distribution

elements capable of operating both on signals transmitted and received at said antenna.

54. (Previously Presented) The antenna as claimed in claim 53, wherein at least one of said signal distribution elements is selected from a group of radio frequency duplexers and switches.

55. (Previously Presented) The antenna as claimed in claim 47, comprising a distributing element configured to:
generate a plurality of replications of a signal to be transmitted by said antenna;
and
distribute said replications of the signal on respective signal processing chains associated with said radiating elements of the antenna.

56. (Previously Presented) The antenna as claimed in claim 47, wherein the antenna unit further comprises at least one element configured to combine a plurality of signals received at the radiating elements and subsequently processed by the signal processing chains, thereby forming a single received signal.

57. (Previously Presented) The antenna as claimed in claim 47, comprising an extraction module configured to extract said information indicating at least one of the weighting coefficients applied by the modules for weighting digital signals.

58. (Previously Presented) The antenna as claimed in claim 47, wherein said antenna unit is located in close proximity to the antenna.

59. (Previously Presented) The antenna as claimed in claim 47, wherein the antenna unit further comprises:

an electro-optical converter module configured to convert an optical signal received at the interface into an electrical signal capable of being processed by said signal processing chains associated with said radiating elements of the antenna.

60. (Previously Presented) The antenna as claimed is claim 59, wherein said electro-optical converter module is associated with an extraction module configured to extract said information indicating at least one of the weighting coefficients applied by the modules for weighting digital signals.

61. (Currently Amended) An apparatus comprising an antenna, the antenna comprising:

a plurality of antenna radiating elements; and

an antenna unit integral to the antenna and comprising one or more signal processing chains associated with the plurality of radiating elements, the antenna unit further comprising:

at least one module for weighting digital signals, the at least one module configured to apply at least a weighting coefficient to a digital signal;

at least one antenna conversion set interposed between said at least one module for weighting digital signals and a respective one of the radiating elements of the antenna, said antenna conversion set being configured to convert between digital signals processed by the at least one module for weighting digital signals and analog signals transmitted and received at a the respective one of the radiating elements; and

an interface configured to receive a data signal and a control signal on the same communication link, the data signal corresponding to one or more digital signals to be processed in the antenna unit and the control signal including information indicating at least one of the weighting coefficients applied by the at least one modules for weighting digital signals, wherein the weighting coefficients applied by the at least one modules for weighting digital signals determine radiation characteristics of the antenna.

62. (Previously Presented) The apparatus as claimed in claim 61, further comprising:

a control unit and an optical link for the transmission of an optical signal between said control unit and an electro-optical converter module associated with said antenna.

63. (Currently Amended) A telecommunications network comprising at least an antenna, the antenna comprising:

a plurality of antenna radiating elements; and

an antenna unit integral to the antenna and comprising one or more signal processing chains associated with the plurality of radiating elements, the antenna unit further comprising:

at least one module for weighting digital signals, the at least one module configured to apply at least a weighting coefficient to a digital signal;

at least one antenna conversion set interposed between said at least one module for weighting digital signals and a respective one of the radiating elements of the antenna, said antenna conversion set being configured to convert between digital signals processed by the at least one module for weighting digital signals and analog signals transmitted and received at the respective one of the radiating elements; and

an interface configured to receive a data signal and a control signal on the same communication link, the data signal corresponding to one or more digital signals to be processed in the antenna unit and the control signal including information indicating at least one of the weighting coefficients applied by the at least one modules for weighting digital signals, wherein the weighting coefficients applied by the at least one modules for weighting digital signals determine radiation characteristics of the antenna.

64. (Currently Amended) A computer-readable medium comprising instructions for execution by a processor, the instructions comprising portions of software codes capable of implementing a method for configuring radiation characteristics of an antenna, the method comprising the steps of:

receiving, at an antenna unit ~~coupled integral~~ to the antenna, a data signal and a control signal on the same communication link, the data signal corresponding to one or more digital signals to be processed in the antenna unit and the control signal including information indicating at least one weighting coefficient to be applied by modules for weighting digital signals that are housed within ~~in~~ the antenna unit;

configuring at least one weighting coefficient in the modules for weighting digital signals based on the information received at the antenna unit; and

applying respective weighting coefficients to digital signals in each of the modules for weighting digital signals, said weighting coefficients determining the radiation characteristics of the antenna.

65. (Previously Presented) The antenna as claimed in claim 47, wherein the interface is a digital data link.

66. (Previously Presented) The antenna as claimed in claim 65, wherein the digital data link is an optical fiber.

67. (Previously Presented) The apparatus as claimed in claim 61, wherein the apparatus is a radio base station.

68. (Currently Amended) A method for configuring radiation characteristics of an antenna, the method comprising:

receiving, at an antenna unit ~~coupled integral~~ to the antenna, a data signal and a control signal on the same communication link, the data signal corresponding to one or more digital signals to be processed in the antenna unit and the control signal including information indicating at least one weighting coefficient to be applied by modules for weighting digital signals that are housed within ~~in~~ the antenna unit;

configuring at least one weighting coefficient in the modules for weighting digital signals based on the information received at the antenna unit; and

applying respective weighting coefficients to digital signals in each of the modules for weighting digital signals, said weighting coefficients determining the radiation characteristics of the antenna.

69. (Previously Presented) The method as claimed in claim 68 further comprising:

replicating a digital signal to generate a plurality of digital signals; and
distributing each of the generated digital signals to a different module for weighting digital signals.